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SPECIFICATION FOR X-RAY TUBE SHIELD

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NEW DELHI 110001

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February 1974

Indian Standard

SPECIFICATION FOR X-RAY TUBE SHIELD

Electron Tubes Sectional Committee, ETDC 39

Chairman

AMENDMENT NO. 1 JULY 1990 TO IS 7012 : 1973 SPECIFICATION FOR X-RAY TUBE SHIELD

(*Designation*) — Substitute '**IS : 7012 (Part 1)-1973**' *for* '**IS : 7012 - 1973**' wherever appears.

(*First cover, Pages* 1 *and* 3, *title*) — Substitute the following for the existing title:

'*Indian Standard*

SPECIFICATION FOR X-RAY TUBE SHIELD

PART 1 TYPE SHX - 1'

(LTD 9)

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(*Continued from page* 1)

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SPECIFICATION FOR X-RAY TUBE SHIELD

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 24 July 1973, after the draft finalized by the Electron Tubes Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard covers the essential characteristics and dimensional details of X-ray tube shields.

0.2.1 At present the standard covers the details of X-ray tube shield SHX 1 suitable for use with the X-ray tube, Type DRA 1 of IS : 3154-1965*. Details of other types of tube shields are under consideration.

0.3 The X-ray tube and the X-ray tube shield are so interdependent that one cannot be checked without the other, and some of the characteristic values are specified for the complete assembly with the tube in position such as inherent filtration. Hence IS : 3154-1965* is a necessary adjunct to this standard.

0.4 Like IS : 3154-1965*, this standard also lays down essential details only. Methods of checking some of the electrical parameters are under consideration.

0.5 This standard is one of a series of Indian Standards on X-ray tubes. A list of standards so far published in this series is given on the fourth cover.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the essential characteristics, dimensional requirements and other technical data relating to X-ray tube shields.

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*Specification for X-ray tubes, diagnostic type.

†Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 1885 (Part IV/Sec 2)-1965[*] and IS : 3154-1965[†] shall apply.

3. TYPE DESIGNATION

3.1 The X-ray tube shield shall be designated by three letters followed by a numeral, the first two letters being accronym of shield, the third letter indicating the intended use of the shield (*X* for use with X-ray tubes). The numeral shall indicate the serial number of the particular type of shield.

Example:

SHX 1 shall mean, X-ray tube shield, Type 1.

4. SPECIFICATION

4.1 The requirements of characteristics and the limits of mechanical dimensions of X-ray tube shields are given in separate specification sheets pertaining to each tube shield type. These sheets also include certain minimum technical data for these shields.

NOTE — At present only one specification sheet is prepared which covers the details of X-ray tube shield SHX 1 designed for use with X-ray tube, Type DRA 1 (*see* Specification Sheet No. 3 of IS : 3154-1965[†]). Details of other types of tube shields are under consideration (*see also* **0.2.1**).

SPECIFICATION SHEET NO. 1

X-RAY TUBE SHIELD, TYPE SHX 1

a) *Application* — This shield is mainly intended to be used with diagnostic X-ray tube with rotating anode — Type DRA 1 (*see* Specification Sheet No. 3 of IS : 3154-1965[†]).

b) *Dimensions* — The dimensions of the shield shall be within the limits specified in Table 1 read with Fig. 1.

TABLE 1 DIMENSIONS

All dimensions in millimetres.

	L	L_1	L_2	L_3	L_4	d	D_1	D_2	D_3	M	N_1	N_2
Nominal	—	166	152	93	21	70	—	—	—	—	80	36
Maximum	470	—	—	—	—	—	141·6	178	136	125	—	—

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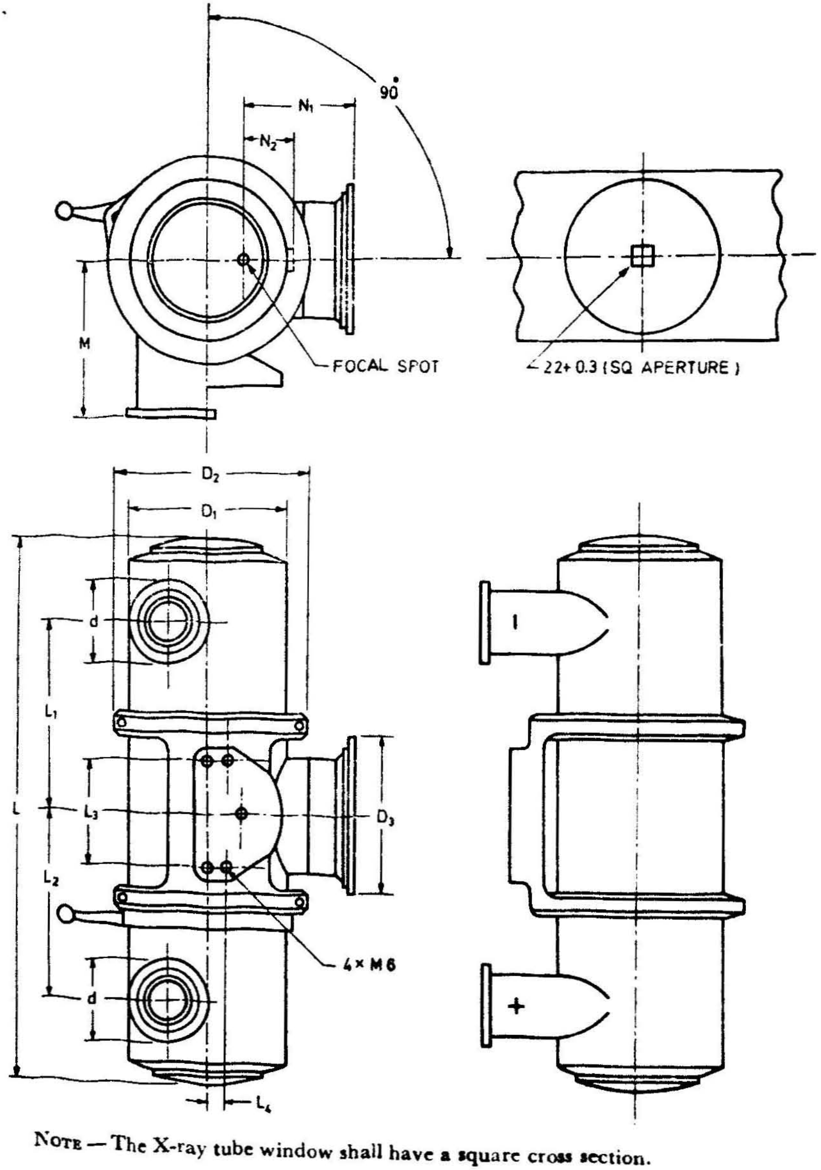
[*] Electrotechnical vocabulary: Part IV Electron tubes, Section 2 X-ray tubes.

[†] Specification for X-ray tubes, diagnostic type.



NOTE — The X-ray tube window shall have a square cross section.

FIG. 1 X-RAY TUBE SHIELD, TYPE SHX 1

c) *Characteristics*

Nominal voltage	125 kV, *Min*
Total heat storage capacity	1 500 000 HU, *Min*
Nominal continuous rating	300 W, *Min*
Maximum permissible outer wall temperature	100°C
Operating ambient temperature range	—10°C to +55°C
Distance between focal spot to diaphragm flange (with DRA 1)	80 mm
Distance between focal spot and the square aperture in the ray-port lead-cone	36 mm
Dimensions of the lead-cone square aperture in the ray-port	22 mm
Total filtration	2·0 mm Al, *Min*
Quick start (0·8 sec)	220 V 5·0 A
Continuation rotation	50 V 1·2 A
Leakage current	Under consideration

d) *Protection* — The tube shield shall be so designed as to afford protection against X-rays in accordance with IS : 6567-1972*.

NOTE — *See also* Item (d) of Specification Sheet No. 3 of IS : 3154-1965†.

e) *Other Technical Data*

1) High tension receptacle on the shield shall conform to IS : 6758-1972‡ and its appropriate polarities shall be marked.

2) The cable used shall be in accordance with ‘ Indian Standard specification for high tension cable for X-ray tubes ’ (*under preparation*).

3) The high tension insulating oil shall be in accordance with the relevant Indian Standard.

NOTE — An Indian Standard on high tension insulating oil is under preparation.

4) The weight with X-ray tube, Type DRA 1 and filled with suitable insulating oil shall be 18 kg approximately.

5) The cable port screw thread details shall be specified.

---

*Radiation protection for an X-ray tube in a protective tube housing, operating between 10 kV and 400 kV.

†Specification for X-ray tubes, diagnostic type.

‡Dimensions for high tension receptacles for X-ray tubes.

INDIAN STANDARDS

ON

X-RAY TUBES

IS:	
1835 (Part IV/Sec 2)-1965	Electrotechnical vocabulary: Part IV Electron tubes, Section 2 X-ray tubes
3154-1965	X-ray tubes, diagnostic type
4096-1967	Method of measurement of optical focal spot size of X-ray tubes (*first revision*)
6567-1972	Radiation protection for an X-ray tube in a protective tube housing, operating between 10 kV and 400 kV
7012-1973	Specification for X-ray tube shield

NOTE — For a complete list of Indian Standards on Electron Tubes, reference may be made to ISI Handbook.

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110001

Telephone : 27 01 31 (20 lines) **Telegrams : Manaksanstha**

Branch Offices:	Telephone
' Sadhna ', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001	2 03 91
F Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002	2 76 49
534 Sardar Vallabhbhai Patel Road, BOMBAY 400007	35 69 44
5 Chowringhee Approach, CALCUTTA 700013	23-08 02
5-9-201/2-A (First Floor), Chirag Ali Lane, HYDERABAD 500001	3 44 35
117/418 B Sarvodaya Nagar, KANPUR 208005	82 72
54 General Patters Road, MADRAS 600002	8 72 78

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